

The rice seed sector in Guinea: Are we missing out crucial stakeholders?

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Abstract

The low use of improved rice seed by farmers in west Africa is not well understood. This study assessed how institutional settings and stakeholder perceptions in the formal rice seed sector inhibit small-scale farmers' access to improved seed. Data were collected in s Guinea, west Africa, in 2007 and 2008. To understand the dynamics of seed interventions in Guinea since the 1980s, key persons were interviewed and relevant literature was reviewed. The results show that, although local seed dealers play a central role in providing seed of local and improved varieties to farmers, seed interventions have mainly relied on the national extension system, NGOs and a new class of contract seed producers that abide by rules and regulations set by the formal seed system. Within a linear model of seed sector development, governmental organizations, the most influential stakeholders of the formal seed system, have been unaware of the central role of local seed dealers in the informal seed system. We argue that in the context of weak extension service due to lack of financial and human resources, farmer-to-farmer dissemination approach centered on the local seed producers and dealers is an option that could be explored to enhance small-scale farmers' access to improved seed. The local seed producers and dealers have shown their willingness to participate in such seed development activities.

Introduction

Rice (*Oryza* spp.) is the main food crop in Guinea; per-capita consumption reached 67 kg per year in 2007 (WARDA, 2007). The national government in collaboration with national and international research and extension institutes has invested heavily, both financially and technically, in rice development in Guinea. This resulted in 340 billion Guinean francs (GNF) (US\$ 67 million) being generated by the local rice sector in 2003, representing 5% of the gross domestic product, and also resulted in a production growth of 5.3% from 2001 to 2005 (WARDA, 2007). However, local production still cannot meet local demand: 40% of the rice consumed is imported (MAEF, 2007a). Increasing domestic rice production is still a priority in Guinea (MAEF, 2007b).

Like many countries in the region, Guinea put special emphasis on the dissemination of quality seed of improved varieties to increase domestic rice production. Since the mid-1980s, several seed development projects have been implemented to supply quality rice seed to (mostly small-holder) farmers. Many of these interventions failed to meet expectations. Failure of seed projects is not specific to Guinea. Past efforts across west Africa to increase rice production by introducing high-yielding varieties have not been that successful (Richards, 1986; Dalton, 2004). Reasons for such failures are not well understood, but in general the poor adaptability of improved varieties to the highly diverse ecologies in which small-holders operate (Richards, 1986), the inefficiency of seed centers (Tripp and Rorhbach, 2001), and the inefficiency of distribution channels (Seboka and Deressa, 2000) are frequently mentioned as reasons for rejection of improved varieties in developing countries.

In this paper, we focus on the inefficiency of distribution channels. We analyze the organization of the rice seed sector in Guinea and examine how institutional settings and stakeholders' perceptions hinder the provision of seed to small-holders by the formal seed sector. The paper ends by discussing how engaging local seed dealers may contribute to making the rice seed sector more effective and seed interventions more sustainable.

Materials and methods

The study was conducted in Guinea. Field activities were undertaken in Lower Guinea from June to December 2007 and from June to December 2008 and covered three sub-prefectures — Molota, Friguiagbé and Moussayah — in the prefectures of Kindia and Forecariah. A total of 10 villages was studied: Bokariya and Sangaran in Moussayah; Seifan and Dentègueya in Molota; and Kinyaya, Hononkhouré, Tour, Yaya, Dandakhouré and Sinta in Friguiagbé. Investigation was also undertaken in three markets — Kindia, Friguiagbé and Sikhourou-Daffira — in the prefectures of Kindia and Forecariah (Fig. 1). These were the markets most often mentioned by the studied households. The Sikhourou-Daffira market was the major market closest to Bokariya and Sangaran.

Archive research, literature review and discussions with resource persons (local agricultural scientists and other experts on the rice seed system) provided information on agricultural policy in Guinea, rice seed projects and stakeholders. We held focus group discussions to understand stakeholders' roles, their perception of the organization of the seed sector, and to explore their views on changes they believe might be necessary for a functional rice seed sector. Two surveys using distinct semistructured questionnaires complemented the focus

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group discussions. One survey targeted 91 rice farming households and the second targeted 41 local seed dealers. The questionnaire administered to farmers looked at their seed use, means of seed acquisition, seed sources and preferred sources, and farmers' relationships with seed dealers. The questionnaire administered to seed dealers looked at seed dissemination, origins of seed and varieties sold, seed quality requested by customers, price indications and price progression throughout the year, dealers' relationships with their customers, and dealers' willingness to cooperate with seed development projects. Local seed dealers were identified using the snowball sampling technique (see Vogt, 1999).

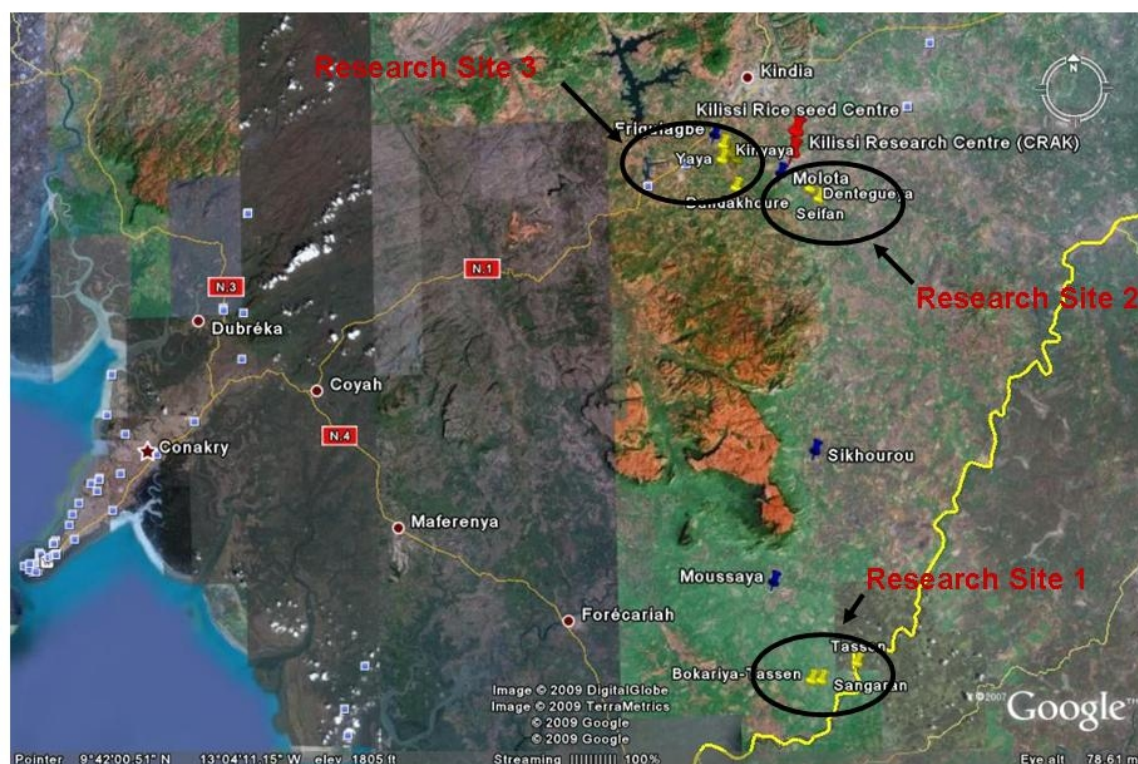


Figure 1. The study area

Legend: Yellow pins = Study villages; Blue pins = Sub-prefectures.

Informal interviews and participant observation helped to collect data on farmers' relationships with seed dealers and gain additional insights into farmers' seed acquisition strategies.

Results and analysis

Stakeholders of the rice seed sector

The national government, SASSAKAWA Global 2000 (SG2000), the World Bank (WB) and Africa Rice Center (AfricaRice) were key stakeholders of the rice seed sector in Guinea (Table 1). They steered interventions through financial, technical and institutional support, and policy development.

Research and extension, under the umbrella of the Ministry of Agriculture, implemented the State's vision of agricultural development. They also implemented seed projects on behalf of AfricaRice, WB and SG2000, thus acting as intermediary stakeholders. Agro-dealers (e.g. Comptoir Agricole) and local NGOs (e.g. APEK) were also intermediary stakeholders. They released emergency seed (along with research, extension, and emergency programs of the Food and Agriculture Organization of the United Nations [FAO] and the World Food Programme [WFP]); trained farmers; and implemented seed projects as national partners of the national and international agricultural research institutes (e.g. AfricaRice). In addition, Comptoir Agricole developed a seed business with farmers.

Farmers are very experienced stakeholders in seed manipulation (selection, use, production and dissemination) to meet diverse objectives of food production and social relations (Nuijten, 2005; Louwaars, 2007; Richards, 2009). They are also the stakeholders most affected by seed interventions. Nevertheless, Guinean farmers contributed little to the seed projects, apart from providing labor on a contractual basis for seed multiplication.

Table 1. Characterization of the stakeholders of the rice seed sector

Stakeholders	Class of stakeholder†	Scope of intervention	Roles	Timeframe of intervention	Involvement in seed project
Individual farmers	Primary	Local (village)	Seed use, production and dissemination	For ages: they build the farmer-seed sector	Yes
FOP-BG, Farmers' association (FA)	Primary	Local and national	Management of seed centers Participation in participatory research activities	Since 2004 Since 1999	Yes
Local seed dealers	Primary	Local	Seed collection/production and dissemination (sales)	14 years of experience (on average)	No
Agro-input dealers: - Comptoir Agricole (CA) - SPCIA	Primary/ Intermediary	Local and national	Seed sale Seed centre (Guéckédou) management	Since 1994 2004	Yes
SNPRV (extension service)‡	Intermediary	National	Training Improved varieties dissemination	Founded 1987 First rice seed project: 1995	Yes
IRAG (national research institute)	Intermediary	National	Research and breeding Elaboration and implementation of seed projects	Founded 1989 First rice seed project: 1995	Yes
APEK (NGO)	Intermediary	National	Training, capacity-building Seed projects implementation Seed distribution	Founded 1989	Yes
Ministry of Agriculture	Key	National	Agricultural development policy Funds	Since the 1980s	Yes
Sassakawa Global 2000§	Key	Supranational	Dissemination of improved varieties and agricultural inputs Funds	1996–2003	Yes
Africa Rice Center (AfricaRice)	Key	Supranational	Technical and methodological support	Founded 1971 First intervention in 1997	Yes
WB, FAO, WFP, IFAD¶	Key	Supranational	Funds		Yes

Source: Archives, surveys and focus group discussions 2007 and 2008.

† **Primary** stakeholders are those who are directly affected, either positively or negatively by seed projects or interventions in the seed sector. **Intermediary** stakeholders are the intermediaries in the delivery or execution of seed projects, research programs and resource flows. **Key** stakeholders are those with the power to influence or 'kill' activity (adapted from Jiggins and Collins, 2003).

‡ Has suffered from lack of funds since early 2000s.

§ No longer intervening in Guinea.

¶ WB, The World Bank; FAO, Food and Agriculture Organization of the United Nations; WFP, World Food Programme; IFAD, International Fund for Agricultural Development.

Local market-oriented seed dealers have emerged in the informal seed sector and have developed consistent expertise in rice seed trade. They have developed their activities without any subsidies and with little external support. They were the main seed suppliers to small-scale farmers. In 2007, for example, farmers purchased seed almost entirely from local seed dealers: 82% from village seed dealers and part-time seed sellers, and 16% from markets. Only 1% of the seed purchased came from an official agro-dealer (Comptoir Agricole). Despite this, the local seed dealers were not involved in any rice seed projects (Table 1). Rather than involving them, projects promoted new ‘elites’ — the formal seed producers, who were expected to produce quality seed of improved varieties and establish their own seed businesses. In practice, the formal seed producers failed to meet these expectations. Since seed projects consistently bought all the seed produced by the formal seed producers, market knowledge did not develop, and as soon as project subsidies ended they stopped producing seed.

The formal seed sector and the local seed dealers operated in different contexts. The formal sector aimed at quality seed production and thus offered expensive seed that small-holder farmers could not afford. Moreover, seed availability is usually considered a prerequisite to adoption (David *et al.*, 2002). Unfortunately, the formal seed sector could not ensure such ongoing seed availability because of the high production cost and the unpredictability of farmers’ seed demands. Local seed dealers filled the gap by supplying a readily available and somewhat poorer quality seed that small-holder farmers could afford. Dealers supplied both improved and local varieties. They thus contributed to disseminating improved varieties. More scientific attention could enable us to learn more about local seed dealers and possibilities for cooperation in providing seed to small-scale farmers and disseminating improved varieties.

Dealers’ profile and features of the seed trade

Forty percent of the studied seed dealers were also rice growers, selling seed they produced themselves, sometimes in combination with selling purchased seed. Other seed dealers were mainly traders. About 80% of the seed dealers were illiterate: the average literacy rate was estimated at 1.6 years of formal education in 2008. The highest literacy level (18 years of formal education) was an agronomist engaged in seed production and seed trade in the Kindia market. Local rice seed trade was dominated by women (66%), except in the Sikhourou-Daffira market where men dominated the seed trade. Seed in general was mainly a women’s affair in the study area. Women spent more time in the seed business than men — an average of 15 years experience, compared to 11 for men.

Local seed dealers were, on average, 45 (SD=14) years old and had on average 14 (SD=9) years of experience in 2008. This suggests that rice seed trade was a recent development in the farmer seed system. Seed trade was even more recent in Sikhourou-Daffira where seed dealers had an average of 6 (range: 4–10) years of experience in 2008. Farmers of Sikhourou-Daffira used to cover their seed needs with their own production. They regularly exported the surplus seed to nearby prefectures. This suggests that seed trade is more successful in less seed-secure farming communities, since farmers first rely on saved seed (from previous harvests).

About 46% of the local seed dealers had an agricultural background and 54% had a trading background. The relatively high proportion of seed dealers with trading background could reduce the quality of traded seed. A strong technical collaboration between seed dealers and the formal seed sector for training in quality preservation would improve seed quality.

Institutional linkages among seed dealers and organizations of the formal seed system were weak. Only 15% of the seed dealers had interacted with rural development organizations at least once. None of them had interacted with seed projects before. The local rice seed dealers therefore operated parallel to and disconnected from the formal seed sector. They could, if involved, be useful bridges between the formal and the informal seed systems.

The annual average seed sale (from 2006 to 2008) was estimated at 2.5 tonnes per local seed dealer. The total seed sales were almost 100 tonnes in 2008. Both improved and local varieties were sold on the open market. In 2008, for example, 31% of the seed sold was of improved varieties. Traded seed came from four sources: farmers (73%); dealers’ own seed production (19%); intermediaries or pre-collectors (8%), who collect seeds from farmers in remote areas for retailers; and the research center (1%).

These findings show that traded seed was almost entirely produced by farmers. The roles of seed dealers consisted of collecting seeds at harvest, storing them, and selling them at sowing time. Seed dealers took the risks of seed conservation and were rewarded by the profit made. In general no chemical treatment was applied. The research center seemed to limit its role to injecting improved varieties. Injected seed of improved varieties having farmers’ consent was multiplied together with local varieties by farmers themselves and distributed by seed dealers. For example, in 2008 improved varieties CK4, CK21, CK90, CK801 and others that had local names (Coyady, Gbotokoly and Chinois) were sold by local dealers.

A kilogram of seed cost, on average, US\$ 0.50 (SD=0.20) on the open market in 2008. This was 50% cheaper than that sold by the research center and the seed centers. Price differences between seed at the market (local seed) and seed from the formal seed system could be justified by the fact that the former was produced by farmers themselves, which reduced the production costs. Seed price generally varied per variety. Improved

varieties were on average cheaper (\$0.40) than local varieties (\$0.60). Thus, the price barrier observed for improved varieties in the formal seed system did not exist on the open market, which therefore increased farmers' access to improved varieties. This was also shown by the high proportion of improved varieties (31%) sold at open markets.

These findings show that local seed dealers actively participate in seed dissemination and could be strategic partners in seed projects, but their future involvement in seed interventions will be largely influenced by the perceptions of the various stakeholders.

Conflicting roles and perceptions of stakeholders

Stakeholders' perceptions of the functioning of the rice seed sector were diverse (Table 2). The extension service, one of the most influential intermediary stakeholders in the sector, believed that farmers could not achieve anything in the seed sector without help, thus losing the opportunity to learn from farmers' practices and indigenous institutions. This perception of the extension service shows its top-down vision of seed development.

While NGOs saw themselves as the main extension agencies, the national extension service perceived the NGOs as simple 'extension tools' that should be at their disposal. Since the extension service had suffered from financial problems since 2003, they saw NGOs more as competitors. As both have developed expertise in farmer training, institutional arrangements that favor collaboration might increase their impact.

Extension and research denied the existence of local seed dealers. They regarded seed dealers as paddy traders. This perception illustrates the formal sector's constant emphasis on the distinction between 'seed' and 'grain'. Moreover, it shows their negative attitude toward farmers' ability to produce or sell seed. The scant scientific attention paid to local practices and institutions of seed production, selection and management does not allow a fair appreciation of farmers' capacities to produce and sell seed. It is true that much remains to be done on the quality of farmers' seed, but we should not deny farmers' capacity to produce and manage seed of self-pollinated crops like rice.

Prospects of involving seed dealers in seed programs

We presented seed dealers with four hypothetical situations (referred to as 'scenarios') to explore their willingness to get involved in formal seed programs (Table 3). This exercise was presented to dealers as follows: a project wants to involve you in seed dissemination activities. What would your position be if:

- Scenario 1: The project gives you free seed and you are requested to sell exclusively to the project seed;
- Scenario 2: The project sells seed to you and you are requested to sell exclusively to the project seed;
- Scenario 3: The project sells seed to you and you can sell the seed along with your own seed;
- Scenario 4: The project gives you free seed and you can sell the seed along with your own seed.

Regardless of the scenario, more than 50% of the local seed dealers indicated that they would be willing to get involved in seed projects. Scenario 4, in which a project would give dealers seed at no charge which they would then be free to sell in addition to their own, appeared the most attractive proposal and was accepted by almost all the seed dealers. Scenarios 1 and 3 had similar acceptance rates, 71% and 73%, respectively. This suggests that seed programs seeking to involve local dealers should permit the sale of both local and improved varieties. Those hesitant to accept scenario 4 (5%) explained their reserve by the fact that they were not yet sure of the quality of the project's seed. "Seed quality helps to keep customers", they said. Dealers refusing to accept scenarios 1 and 2 explained that they feared losing their customers. One respondent in this category of dealers said, "*I do not want to be seen in my area as the salesman for project's seed/varieties; the project will cease activities one day and I will have to continue my business*". This statement shows that seed business is becoming an occupation in which sustainability is a concern. For scenario 3, dealers explained their refusal in terms of the risk they incurred of losing their regular customers should the project's varieties fail to meet farmers' expectations. In all scenarios, hesitant dealers explained their 'Do not know yet' responses by saying that they would prefer to check whether the project's varieties were well adapted to the local environment before agreeing to sell them.

Despite this general willingness to get involved in seed programs, dealers listed a number of conditions necessary for their involvement (Table 4). A regular seed supply and 'adaptability of varieties' to local ecologies were the two most important conditions. Other important conditions were 'good seed quality' and a price that allows profit. The average price of \$0.50 per kilogram on the open market in 2008 could be regarded as being affordable by farmers. Consequently, a seed project, if willing to involve seed dealers, would have to supply dealers at less than \$0.50 per kilogram. Strikingly, seed quality seemed to be of less importance to dealers in scenarios 1 and 2. They probably assumed that a project requesting an exclusive sale would assure seed quality.

Table 2. Stakeholders' perceptions†

	SNPRV	IRAG	APEK and SARA (NGOs)	Seed centers	Comptoir Agricole (CA)	Local seed dealers	Individual farmers
SNPRV	XXX	Partner in seed projects elaboration and implementation	Strengthen the extension system. Resources SNPRV should use	Currently non operational. Their role is partly played by CRAK (IRAG)	—‡	Rather paddy dealers	Incapable of achieving any good development. They constantly need assistance
IRAG	Partner in program elaboration and implementation	XXX	Partners (seed dissemination)	Need to be strengthened	Partners in seed distribution	Rather paddy dealers	Should use improved varieties and seed from the formal seed sector
APEK and SARA (NGOs)	Training partner	Training partner	XXX	Ineffective	Partner (occasional seed distribution)	Very small-scale business holders	Need to be empowered
Seed centers	Lacks fund to properly operate	Tends to play the roles of seed centers	Useful dissemination network	XXX	Competing stakeholder	Very small-scale business holders Paddy dealers	They do not know the value of 'quality' seed
Comptoir Agricole (CA)	—	Partners in seed delivery	Partners in seed delivery	Should be closed	XXX	Competing stakeholder	Customers (commercial relationships)
Local seed dealers	Unknown§	Unknown	Unknown	Unknown	Unknown	XXX	Customers (commercial relationships)
Individual farmers	Ineffective (absent from the field) Unknown to some farmers	Seed rarely available Unknown to some farmers	Training of farmers' associations Little attention to non-group members	Frequent seed shortage Unknown to some farmers	Unknown to some farmers	Major seed suppliers	XXX

Source: Surveys 2007–2008.

† In the first column are the respondents and, in the top row are the responses/perceptions.

‡ '—' means there was no perception expressed on that stakeholder. From this it is deduced that there is no tension between them.

§ 'Unknown' means the responding stakeholder did not know the stakeholder or did not know the roles it plays in the rice seed sector.

Table 3. Scenarios mapping on seed dealers' willingness to cooperate with seed projects

Response	An organization/project wants to involve you in seed dissemination activities. What would your position be? (% of farmers)			
	Scenario† 1	Scenario 2	Scenario 3	Scenario 4
Accept	71	56	73	95
Refuse	12	10	12	0
Do not know yet	17	34	15	5

Source: Surveys 2007–2008.

† Scenario 1: The project gives you free seed and you are requested to sell exclusively the project seed; Scenario 2: The project sells seed to you and you are requested to sell exclusively the project seed; Scenario 3: The project sells seed to you and you can sell the project's seed along with your own seed; Scenario 4: The project gives you free seed and you can sell the project's seed along with your own seed.

Table 4. Requirements for collaboration with formal seed projects

Requirement	Scenario† 1 (%)	Scenario 2 (%)	Scenario 3 (%)	Scenario 4 (%)
Regular seed provision	35	14	20	58
Adaptability of project's varieties	27	48	10	4
Exclusively local varieties	12	10	20	13
Proven profit	27	29	–	–
Good seed quality	–	–	40	17
Credit	–	–	10	–
Storage facilities	–	–	–	8

Source: Surveys 2007–2008.

† Scenario 1: The project gives you free seed and you are requested to sell exclusively the project seed; Scenario 2: The project sells seed to you and you are requested to sell exclusively the project seed; Scenario 3: The project sells seed to you and you can sell the project's seed along with your own seed; Scenario 4: The project gives you free seed and you can sell the project's seed along with your own seed.

Conclusion

In Guinea, farmer-to-farmer extension is an option that could be explored for developing a suitable rice seed sector, especially in this context where the extension service lacks funds and the few existing local NGOs operate on a relatively small scale. In many agro-ecological contexts and for several crops, farmer networks and seed dealers are the most frequently used channels for information sharing and seed dissemination (Jones *et al.*, 2001; Ndjeunga, 2002), although social differentiation and geographical distance could raise barriers to seed dissemination through farmers' networks (Almekinders and Thiele, 2003). In such a model of seed distribution that emphasizes farmer-to-farmer exchange, state organizations and NGOs would mainly train existing local seed producers and dealers in appropriate techniques of seed multiplication and processing, while giving them the managerial skills needed to enlarge their businesses. Similar suggestions have been made for pearl millet (Ndjeunga, 2002) and beans (Rubyogo and Sperling, 2009). Local seed dealers would provide a meeting point between the formal and farmer seed systems. The role of seed projects and research centers would be to introduce new varieties into the farming community via local seed dealers and agro-dealers, whose capacities they would strengthen to raise the sanitary and physiological quality of seed they sell. Our results clearly show seed dealers' willingness to participate in such seed development activities.

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